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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,958

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Tsuyoshi Yoshitake

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EXAMINER

AHMED, SHAMIM

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/574,958	Applicant(s) YOSHITAKE, TSUYOSHI	
	Examiner Shamim Ahmed	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/7/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it is too long. Correction is required. See MPEP § 608.01(b).
2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 and 13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshitake et al ("Droplet-Free Thin Films Prepared by Pulsed Laser Deposition...", Jpn.J.Appl.Ph), s. Vol. 41 (2002) pp.836-837).

Yoshitake et al disclose a deposition process and system for depositing a thin film, wherein a rotating velocity filter having perforations is disposed in between the substrate and a target. Yoshitake et al discloses the deposited film is droplet free, wherein the velocity filter eliminates or screened droplets having lower velocity or lower speed and only droplets, resemble as the claimed particles are passes through the filter those have higher velocity or higher flying speed (see first column at page 836).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 6, 8,10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroshi et al (JP-08-176805) in view of Hidehiro et al (JP-2001-192811).

Hiroshi et al disclose a process and apparatus for depositing film on a substrate (16), wherein the apparatus including a rotating mesh or grid-like structure (17), reads on the claimed rotating porous filter plate in which the mesh or grid-like structure disposed between the substrate and a target (15) and the film formation rate is controlled during the formation of thin film by laser ablation process and to prevent the generation of droplet (see abstract, figure 1 and paragraphs 0012, 0015-0017 of the translated version). Hiroshi et al also teach that the mesh structure having crevices or perforations having different sizes depending on its rotation (paragraph 0017).

Hiroshi et al remain silent regarding the step of the particles having higher flying speed passes through the grid-like structure and the particles having less or lower flying speed trapped.

However, Hidehiro et al illustrate a similar deposition process and apparatus including the step of controlling or limiting the flying path of the film deposited particles are uniformized by selecting the speed of rotating choppers (3a, 3b) in order to form the thin-film with high density and free from defects (see abstract, paragraphs 0013,0014,0022).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Hidehiro et al's teaching into Hiroshi et al for depositing a defect free film with process uniformity as taught by Hidehiro et al.

As of claim 4, Hiroshi et al also teach that the crevice or perforation in the board 17 needs to be larger than the particle diameter to passes through (paragraph 0013).

As to claim 6, both the Hiroshi et al and Hidehiro et al illustrates that the rotatory filters or grid-like structure with perforation is disposed parallel to the rotatory shaft (see figure 1 in Hideshiro et al).

As to claim 8, it would have been obvious to have the perforations are diagonal to the rotatory shaft as such is an obvious design choice of the device.

As to claim 12, Hiroshi et al appears to teach that the perforations are formed by laminating of disks having through holes with different diameters (see paragraph 0013, figures 2-5 in Hiroshi et al and also see 3a,3b and 2 of figure 1 of Hidehiro et al).

As to claim 14, Hiroshi et al appears to teach that the size of the crevices or perforations are controlled during the deposition while rotating speed control the size and shape of diameter of the crevice (paragraphs 0017,0018).

As to claim 16, Hiroshi et al illustrate the deposition process comprises laser abrasion (see the abstract).

7. Claims 2 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroshi et al (JP-08-176805) in view of Hidehiro et al (JP-2001-192811) as applied above, and further in view of Denton et al (4,4,395,323).

Modified Hiroshi et al discusses above in the paragraph 6 except the perforations are formed in the metal disk by etching.

However, Denton et al teach an improved sputtering process including the introduction of metal mesh to pass through particles (31) to a substrate (21) surface, wherein the mesh or perforations are formed on a metal sheet by punching or etching (col.3, lines 14-25).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Denton et al's teaching into modified teaching of Hiroshi et al for efficiently forming the perforation as the etching technique is very well known and conventional way to form mesh or perforations on a substrate as taught by Denton et al.

One of ordinary skilled would do so for reducing the process cost as etching is well known technique to form mesh or perforations on a substrate.

As to claim 2, modified teaching may not teach that the perforations or mesh are 80% or more surface area of the porous filter but Denton et al illustrate that the arrangement in figure 2 permits over 90% of the material or particles to pass through the mesh like anode 15 to be deposited on the substrate (21) leading to very high rate of deposition with minimal damage to the substrate (col.4, lines 38-45).

As to claim 12, Denton et al teach that different size mesh or voids could be used depending on the process conditions such as the type of cathode material used, vacuum value and the applied voltage differences (col.3, 36-44).

8. Claims 5, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroshi et al (JP-08-176805) in view of Hidehiro et al (JP-2001-192811) as applied above, and further in view of Yoshitake (Droplet-free thin films ----- using a vane velocity filter).

Modified Hiroshi et al discusses above in the paragraph 6 except the mathematical expression of the maximum speed (V_{max}) and the minimum speed (V_{min}) of the particles that can be trapped and passes through the porous filter, respectively.

However, Yoshitake et al disclose a deposition process and system for depositing a thin film, wherein a rotating velocity filter having perforations is disposed in between the substrate and a target. Yoshitake et al discloses the deposited film is droplet free, wherein the velocity filter eliminates or screened droplets having lower velocity or lower speed and only droplets, resemble as the claimed particles are passes

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through the filter those have higher velocity or higher flying speed (see first column at page 836).

In the above teaching, it is noted that Yoshitake et al's expression for the "exceeding the velocity "nfl" reads on the claimed V_{\max} as the particles passes through the vane-like perforations and the particle or droplet having cutoff velocity ($V_c = nfl$) will be completely screed or trapped reads on the claimed maximum velocity of the trapped particles.

Therefore, it would have been obvious to combine the Yoshitake et al's teaching into modified teaching of Hiroshi et al for efficiently controlling or obtaining a droplet free deposited film as suggested by Yoshitake et al.

As to claim 5, Yoshitake et al illustrate that the vane-like perforations (shown in figure 1) and the figure shows that the diameter of the vane-like perforations have diameter greater in the edge portion of the circular porous filter than that of the perforations far from the edge and such arrangement is capable of trapping the particle at low rotational speed as claimed and furthermore, such limitation is an intended use of the filter.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Iwase et al (2002/0023831) teach sputter-deposition is carried out with the use of a grid-like filter in order to control the flying of the particles (paragraphs 0039, 0066 and figure 6).

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on Tu-Fri (6:00-2:30) Every Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shamim Ahmed
Primary Examiner
Art Unit 1792

SA
June 11, 2009

/Shamim Ahmed/
Primary Examiner, Art Unit 1792